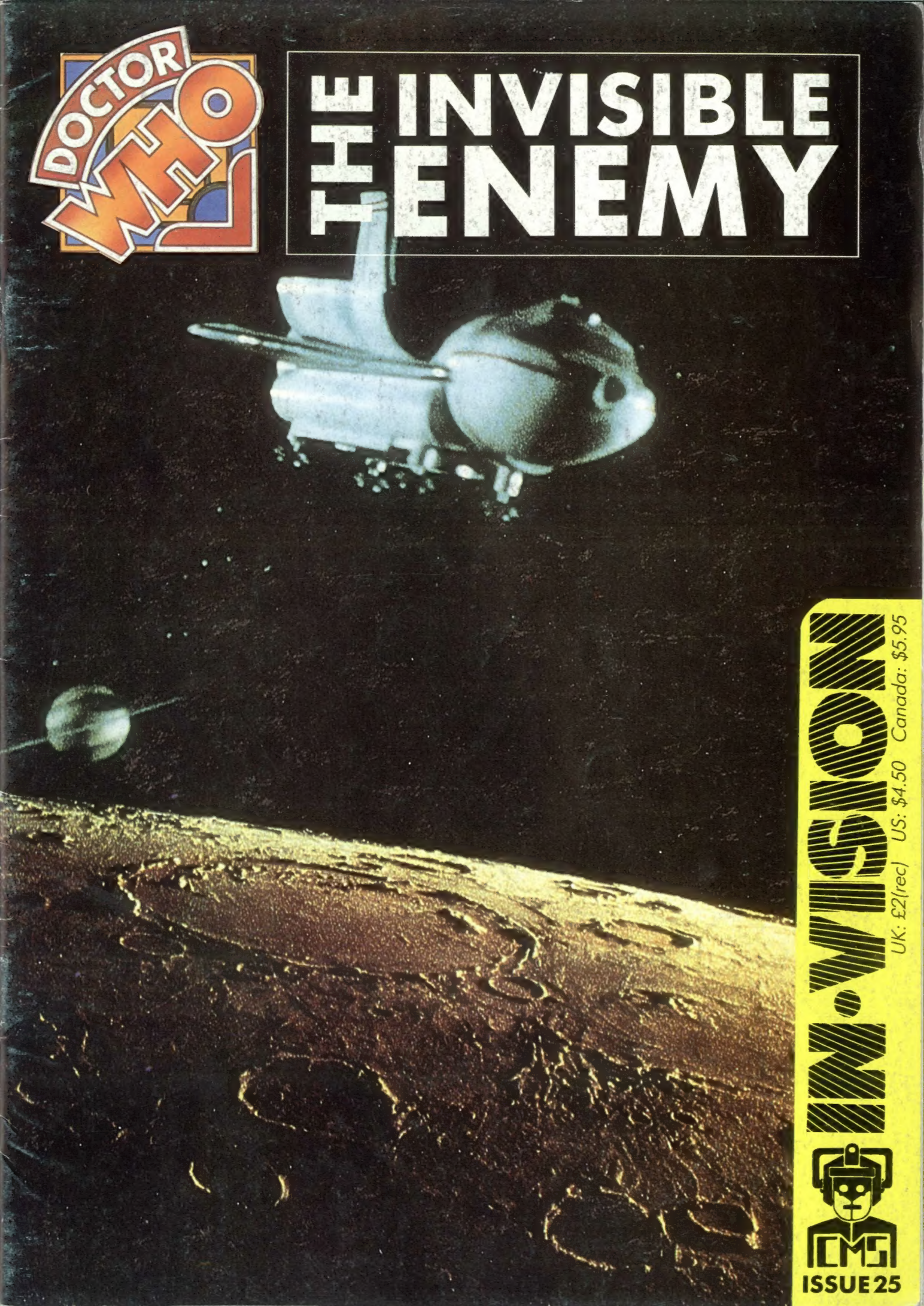
DOCTOR WHO

THE INVISIBLE ENEMY



TITAN

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CMS

ISSUE 25

Front cover: Kaye Neine

Context

THE INVISIBLE ENEMY: SERIAL 4T, SEASON 15, STORY 93

THE INVISIBLE ENEMY was one of the most effects-intensive **Doctor Who's** made. It needed two effects designers to cope with the amount of work, and the results were variable.

The studio effects ranged from the excellent (like the creation of K•9) through the mediocre (the monster) to the abysmal (an obviously pre-collapsed wall). The background to K•9 is explained in *Production*, and the reaction to his debut is explored in *Audience*.

The miniatures are, almost without exception, stunning. Ian Scoones, who was Visual Effects Designer for the model work, was of immense help to **IN•VISION**, providing both an interview and details of how the effects were achieved (see *Production*). He also provided many of the behind-the-scenes photographs, most of which have never before been published.

But without taking the effects or K•9 into account, THE INVISIBLE ENEMY is still worthy of note. It is directed by Derrick Goodwin, more noted for his studio high drama than action or science fiction shows, and it is written by the established **Who** team of Bob Baker and Dave Martin. Bob Baker talks about the scripting of the story — and the relationship (or lack of it) with *Star Wars* in the extended *Production* feature.

Although first shown in the shadow of the release of *Star Wars*, THE INVISIBLE ENEMY is remembered with affection — and for its homage to another film, *Fantastic Voyage*, which the third episode pastiches. While this was not generally a popular move amongst fans when the show was first transmitted, it does now strike a chord with some viewers. *Harry and Wally's Favorite TV Shows* lists the best stories for each Doctor. Tom Baker's, according to Harry and Wally, are: THE TALONS OF WENG-CHIANG, THE PIRATE PLANET, GENESIS OF THE DALEKS, and THE INVISIBLE ENEMY. No explanation is given for any of the choices except THE INVISIBLE ENEMY, which is described as: "a *Fantastic Voyage*-style journey through the Doctor's own body".

As the story review points out, many aspects of the serial are far from perfect, but the scripting is sound, and in the model effects it excels. For this alone it is worth remembering. □

CAST

DR WHO ..... Tom Baker
LEELA ..... Louise Jameson
SAFRAN ..... Brian Grellis (1-2,4)
SILVEY ..... Jay Neill (1)
MEEKER ..... Edmund Pegge (1)
CREWMAN ..... Anthony Rowlands (1)
SUPERVISOR LOWE ... Michael Sheard
NUCLEUS VOICE ..... John Leeson
RECEPTION NURSE .... Nell Curran (2)
PROFESSOR MARIUS ..... Frederick Jaeger (2-4)
PARSONS ..... Roy Herrick (2-3)
VOICE OF K•9 ..... John Leeson (2-4)
OPTHALMOLOGIST ..... Jim McManus (2-4)
HEDGES ..... Kenneth Waller (2)
CRUIKSHANK ..... Roderick Smith (2-3)
MARIUS'S NURSE ... Elizabeth Norman (2-4)
MEDIC ..... Pat Gorman (3-4)
NUCLEUS ..... John Scott Martin (2-4)

SMALL & NON-SPEAKING

BI-AL MEMBERS (2-4) .... Leslie Bates, Derek Hunt, Margot Gordon, Kenneth Sedd, Cy Town, Alan Clements
CREWMEN (1) ..... Harry Fielder, Stuart Myers
COMPUTER VOICE ..... Anthony Rowlands (1)

CREW

PRODUCTION ASSISTANT ... Norman Stewart
ASSISTANT FLOOR MANAGERS ..... Tony Garrick, Christabel Albery
DIRECTOR'S ASSISTANT ..... Pat Harrington
FLOOR ASSISTANT ..... Lindsay Trenholme
TECHNICAL MANAGER ... Dickie Bird
STUDIO LIGHTING ..... Brian Clemett
STUDIO SOUND ..... Michael McCarthy
GRAMS OPERATOR ... Dave Thomson
SENIOR CAMERAMAN ..... Peter Hider
CREW 10
FILM CAMERAMAN ..... Nick Allder
FILM EDITOR ..... Glenn Hyde
FILM OPERATIONS MANAGER ... Ian Brindle
COSTUME DESIGNER ..... Raymond Hughes
MAKE-UP ARTIST .. Maureen Winslade
MAKE-UP ASSISTANTS .. Eve Barker, Carolyn Buissine
VISION MIXER ..... Shirley Coward
VIDEO EFFECTS ..... A. J. Mitchell
VISUAL EFFECTS DESIGNERS .. Tony Harding, Ian Scoones
VISUAL EFFECTS ASSISTANTS .. Mat Irvine, Steve Bowman
DESIGNER ..... Barry Newbery
DESIGN ASSISTANT .... Les McCallum
DRAUGHTSMEN ..... Les McCallum, Shelagh Lawson, Murray Picknett
INCIDENTAL MUSIC . Dudley Simpson
SPECIAL SOUND ..... Dick Mills
PRODUCTION UNIT MANAGER .. John Nathan-Turner
STORY ..... Bob Baker, Dave Martin
SCRIPT EDITOR ..... Robert Holmes
PRODUCER ..... Graham Williams
DIRECTOR ..... Derrick Goodwin

TRANSMISSION

Part 1: 1st October 1977, 18.20.02 (23' 09")
Part 2: 8th October 1977, 18.04.18 (25' 13")
Part 3: 15th October 1977, 18.13.29 (23' 28")
Part 4: 22nd October 1977, 18.12.52 (21' 22")

FILMING

Bray Film Studios

RECORDING

10th, 11th, 12th April 1977 (studio TC6)
24th, 25th, 26th April 1977 (studio TC6)
BBC Television Centre, London

VT NUMBERS

Part 1: VTC/6HT/ B16290/ED
Part 2: VTC/6HT/ B16291/ED
Part 3: VTC/6HT/ B16292/ED/ED
Part 4: VTC/6HT/ B16293/ED

REFERENCES

LITERATURE

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CASTLEMAN, Harry and PODRAZIK, Walter J. *Harry and Wally's Favorite TV Shows* (Prentice Hall, 1989)
DICKS, Terrance. *The Adventures of K•9 and Other Mechanical Creatures* (Target, 1979)
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HAINING, Peter. *Doctor Who — A Celebration* (Chapter 6 — The story of K•9. W. H. Allen, 1983)
HAINING, Peter. *The Doctor Who File* (W. H. Allen, 1986)
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IRVINE, Mat. *Doctor Who Special Effects* (Beaver Books, 1986)
TULLOCH, John and ALVARADO, Manuel. *Doctor Who: The Unfolding Text* (Macmillan, 1983. Story as a critique of galactic imperialism — p325)

RECORDS

Doctor Who Sound Effects ('Cloning and miniaturisation process', 'Inside the Doctor's mind', BBC Records & Tapes, REC316, 1978)

ARTICLES

Aggedor 7, August 1984 (Alec Charles finds it "rather Gothic" but "slightly immature")
Citizen of the Universe December 1983 (Linda King compares to **Quatermass II**)

Daily Mail 24 October 1977 (Notes the *Fantastic Voyage* influence and comments that the last episode was, uncharacteristically, "positively crammed with incident".)

DWAS Yearbook May 1978 (Review by Keith Barnfather)
DWB 23-25, Summer 1985 (Graham Williams interview)
DWB — A Voyage Through 25 Years of Doctor Who, December 1988 (Season 15 review by Justin Richards)
Doctor Who Files — Season 15
Doctor Who Magazine 14 (Making of K•9), 17 (K•9 blueprints), 85 (Louise Jameson interview), 116 (John Leeson interview), 118 (Anthony Read interview), 134 (Archives)
Doctor Who Magazine Winter Special 1983/4 (Graham Williams interview)
Doctor Who Magazine Winter Special 1986 (The Tom Baker years)
Frontios August 1985 (Tim Westmacott comments)
Gallifrey 2, December 1977; 3, March 1978
Radio Times w/e 7, 14, 21, 28 October, 1977, 4 Novemebr 1977 (letter from Amanda Jones re clones being clothed)
Quark 1, November 1977 (review by Kevin Davies); 2, July 1978 (Mat Irvine comments)
Shada 19, November 1985 (Andy Lane comments)
Sonic Waves 1, 1984 (Alan Hayes sees story as under-rated)
Space Rat 8, January 1985 (Andrew Glazzard comments)
Spotlight on Who 5, January 1980 (Bob Baker interview)
Tardis Vol 5 no. 3/4, 1980 (Ian Scoones interview); 3/1, Feb 1978; 3/3, June 1978
Time Out w/e 13 October 1977 (found part one "a disappointing start"), w/e 29 October 1977 (called the story "one of the weakest for a long time")
The Times 10 October 1977 (Stanley Reynolds reviews **Who** and **Top of the Pops**)
Time Screen 5, February 1986 (Reports that K•9 was originally called 'Fido' — no source given for this); 8, December 1986 (Andrew Pixley erroneously says some fx footage was done for a **Quatermass**

Next issue *Doctor Who* begins a brand new adventure – Image of the Fendahl. The time is the present; the location: Earth. And Doctor Who investigates dangerous experiments with a human skull – 12 million years old!

remake)
Zerinza 21, February 1981 (Jack Dyer says human heredity allows Virus to act)
Zygon 2, January 1985 (review by Jackie Marshall)
23/11/63 2, July 1978 (Tim Robins comments); 4, December 1978 (Tim Robins compares to *Star Wars*); 6, May 1979 (Tim Robins makes yet more comments)

TELEVISION

Blake's Seven (BBC, 1977-1980)
Blue Peter (BBC)
Buck Rogers in the Twenty-fifth Century
Clapperboard (Granada)
Galloping Galaxies (BBC, 1977)
Grange Hill (BBC)
Quatermass (Euston films, 1979)
Quatermass II (BBC, 1955)
The Quatermass Experiment (BBC, 1953)
Space: 1999 (Anderson/Burr, 1976-1977)
Those Were the Days (BBC, 1970)
Thunderbirds (Anderson/Century 21, 1965)
Top of the Pops (BBC)

FILMS

2001: A Space Odyssey (Stanley Kubrick, 1968)
The Battle of Britain (Guy Hamilton, 1969)
The Black Hole (Gary Nelson, 1979)
Fantastic Voyage (Richard Fleischer, 1966)
Forbidden Planet (Fred M. Wilcox, 1956)
The Humanoid
Silent Running (Douglas Trumbull, 1971)
Star Wars (George Lucas, 1977)
The Swiss Family Robinson (Edward Ludwig, 1960)

DOCTOR WHO

The Curse of Peladon (serial MMM)
Frontier in Space (serial QQQ)
Genesis of the Daleks (serial 4E, **IN•VISION** 4)
Horror of Fang Rock (serial 4V, **IN•VISION** 24)
The Invisible Enemy (serial 4T, **IN•VISION** 25)
The Mutants (serial NNN)
The Pirate Planet (serial 5B)
Pyramids of Mars (serial 4G, **IN•VISION** 9)
The Robots of Death (serial 4R, **IN•VISION** 20)
The Sontaran Experiment (serial 4B, **IN•VISION** 3)
The Space Pirates (serial YY)
The Sun Makers (serial 4W, **IN•VISION** 27)
The Talons of Weng-Chiang (serial 4S, **IN•VISION** 21)
Underworld (serial 4Y, **IN•VISION** 28)
The Invasion of Time (serial 4Z), **IN•VISION** 29)

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Martin Rian-Tobias takes us through the fantastic voyage that was

The Invizibul Enemmie

A MODEL spaceship powers its way through a reassuringly realistic and convincing solar system. The scene is set, and the script wastes no time in throwing us into the plot. The players are quickly established — both the goodies (Doctor and Leela) and the villains: a shuttle crew who are worryingly quickly infected with, and now carry, a virus which has the horrible effect of leaving them looking like a cross between Richard Nixon and Dennis Healey.

From now on it's what the public considers staple **Doctor Who** fare — a wooden set, with acting to match. If the shuttle crew have a redeeming feature, it's their space suits which sport a design and look to rival *2001: A Space Odyssey*.

Meanwhile Leela is learning to chalk her name on a blackboard, which seems appropriate given that the station controller on Titan is revealed to be none other than Mr Bronson from **Grange Hill**. And he seems to have as much control over a space station as he does over a classroom — it's not going to be long before he picks up on this story's Baker & Martin catchphrase "Contact has been made".

But while the human elements may be lacking in some departments, some of the space shots and outside scenes are staggering (though some, like the shuttle initially picking its way through the asteroid belt, are less successful).

The studio effects are not so exciting — is dull purple really the colour which time lords should glow? The studio sets are a bit variable, as is the apparent density of some of the doors. Even Tom Baker is impressed when he walks into the TARDIS and finds it doesn't wobble: "That was odd", he mutters.

But despite the sets' and spacesuits' best efforts, our first shoot-out is as unimpressive as the rave-up which occurred in the same room about ten minutes earlier. Follow this with the station controller hiding behind a yukka plant that wouldn't protect an ozone layer and the most impressive feature becomes the ray-blast effects — which seem to have escaped from a *Cheesits* advert.

But as the episode draws to a close the spacesuits again demonstrate their worth, and we find that Leela's rubber knife can only penetrate to a depth of a few millimetres.

But when all is said and one, the story comes across well. We are never in any doubt as to what is happening. The script is kept short and to the point, and the station controller's acting is another definite bonus — you can see how he got the job ahead of the others.

But then — horrors! Just when it seemed like the model-work was the only safe haven, we get the Bi-Al Death Star, looking rather the worse for wear. But the interiors are impressive, even if they do double as K•9's native habitat. And in part two, K•9 makes his debut, spewing ticker-tape like a space-age cash till. Great stuff — but why does he rarely do this again?

On the costume side, Marius is obviously a senior chap as he stands out a mile from the other staff. As Terrance Dicks says in the *Target* novel: "too senior to be bothered with looking respectable". And his half-moon spectacles win hands down over Lowe's surfing goggles. Parson s in particular gets a raw deal with his white suit complete with funny hat and a CD on his head — presumably to show how advanced civilisation has now become.

Leela's costume still provokes the usual effect, drawing one of the worst-ever come-on lines from Marius: "I should like to have you scanned and datalised", he says looking her up and down.

And now at last the make-up department are coming into their own as more and more people get eyebrowed. Lucky they are all hanging around waiting to get contacted.

But not as convenient as the handy cloning booth that Marius keeps in his lab. Still, if cloning really is a cheap trick perhaps he runs a few up of an evening to impress the nurses.

Marius also seems to be well-up on his old movies, so perhaps re-runs of *Fantastic Voyage* are also in order. Certainly he must be well practised in picking up microscopic clones through a syringe, especially with his

The only advertisement that could legitimately cash-in on K•9's appeal

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COMPLETE STOCK OF FUTABA RADIO AND ACCESSORIES OBTAINABLE FROM US.
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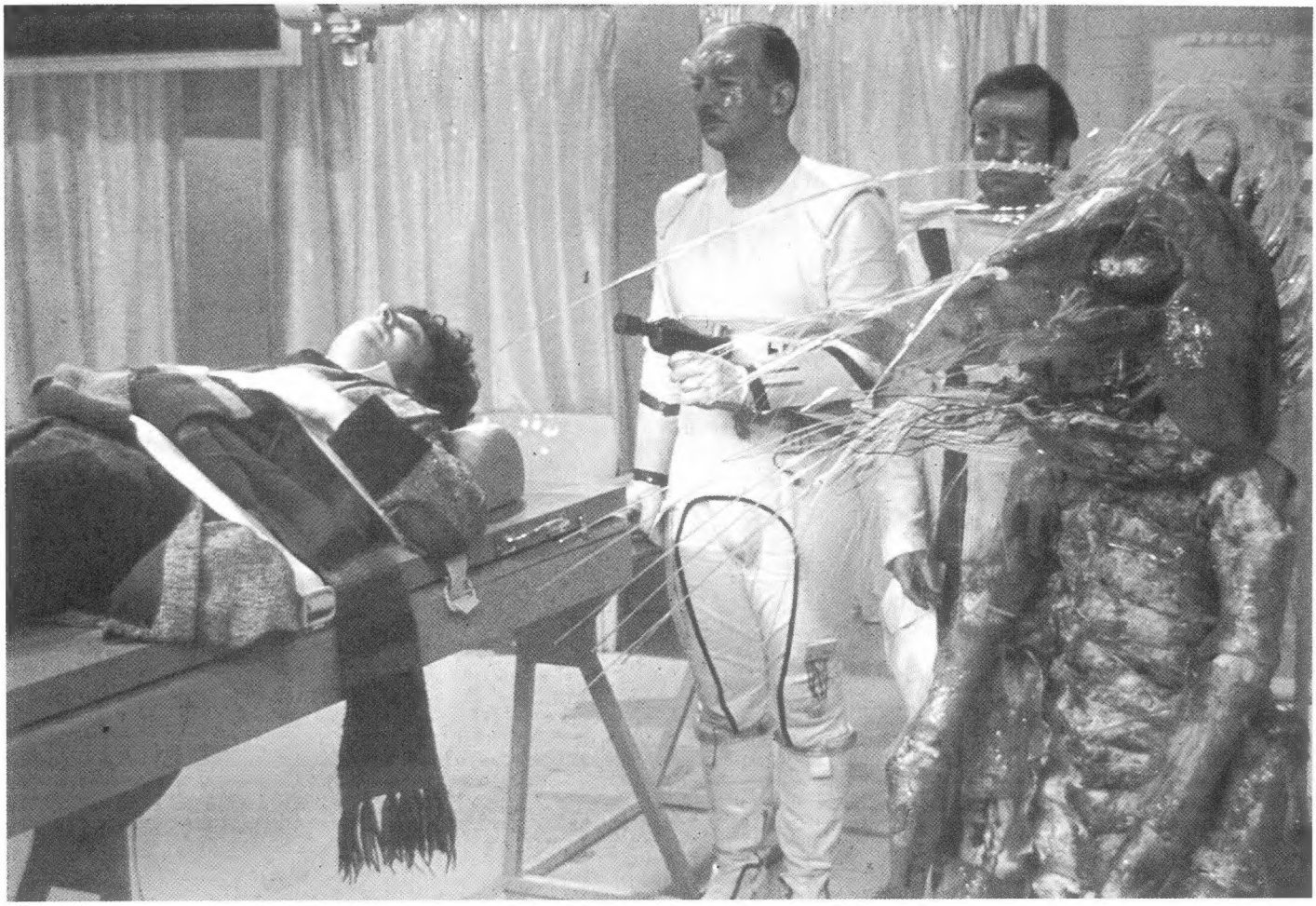
R C SYSTEMS — PLANES — HELICOPTERS — BOATS — CARS — TANKS
WE HAVE A VERY LARGE AND COMPREHENSIVE STOCK OF ENGINES AND ALL ACCESSORIES. YOU CAN FIND US EASILY, CLOSE TO HEATHROW AIRPORT AND THE M3, M4 AND M40 MOTORWAYS.
HOW TO FIND US
To Hayes
West end M40
M4
To London
Post House
Cranford Lane
WE ARE HERE
214
High St.
ALWAYS READY MADE MODELS FOR SALE. WE BUY AND PART EXCHANGE MODELS AND ENGINES. ADVICE AND HELP IN FLYING GIVEN TO ALL PURCHASERS OF R C GEAR AND HELICOPTERS.
OVERSEAS CUSTOMERS MADE VERY WELCOME. (GOODS LESS VAT IF LEAVING COUNTRY.) BARCLAYCARD - ACCESS - MASTERCHARGE - HOBBYCARD AND H.P. FACILITIES.
HOURS: MON. TUES. THURS. SAT.



eyesight.

But the pace is building. And despite K•9's rather pathetic laser attempts to knee-cap the villains, the effects work is reaching another high as the Doctor and Leela bubble-swirl into the next exciting episode.

In many ways part three is the best of the lot. The passing thought in the Doctor's head is the sort of nice touch that puts **Doctor Who** a step ahead of other programmes in the genre.

Unfortunately, K•9 is seen and heard in motion for the first time, and even Dudley Simpson can't rival the whine of the robot's engines.

The scenes within the Doctor's head are well designed and accomplished. Which is more than can be said for the Incredible Collapsing Wall. And with the emphasis now on overlooking the obvious, Marius realises (suddenly) why Leela in immune to the virus. Incredible really. Especially since the Doctor has already explained it to him.

Meanwhile the Doctor's clone is now explaining his own brain, and showing annoyance at Leela's lack of interest. But luckily all this is interrupted by the fluffy balloons which engulf Lowe and the visual aspects of the story take a dive.

In fact, the Nucleus is so disappointing that even Dudley Simpson doesn't seem to notice it. Shrouded under Darth Vader's cloak, it appears with all the horror of a prawn salad. But as ever the pace is perfect, with the Doctor's debate with the Nucleus pointing up the issues and the tension before the confused episode ending.

So now, in part four, we have a full knowledge of the plot and are just waiting for the solution. The Nucleus seems not to add very much, and even the Doctor tells it: "You megalomaniacs are all the same — I've heard it all before." Which is probably just as well, as it's difficult to understand what the Nucleus is saying.

But whatever it is, the Doctor finds the *real* solution at breakneck speed and follows the impressive shuttle back to Titan. Here he finds some terrific model-work, which (on Leela's advice, for a change) he blows up. So the story is completed with the usual **Doctor Who** panache, an alternative solution hit-upon at the last moment and a few knife-edge escapes.

All in all a cracking story told at a good pace with stunning model effects. A little low on interest in terms of studio camera work and acting, and with variable floor effects (and awful wall effects). It is of course Tom Baker more than anyone who holds together a plot about, when all's said and done, a rather run-of-the-mill threat to dominate the universe. But it's fast, exciting and fun — all this and K•9 too... Well, you can't have everything. □

Audience

K•9 was planned as **Doctor Who's** big secret weapon for 1977. A genuine gadget robot, K•9 was designed to appeal to younger fans. The idea was to win back the family audience that had watched the Pertwee years, but which the BBC felt had been eroded by the horror excesses of the Hinchliffe years.

Unfortunately, the **Doctor Who** production office and *Radio Times* failed to agree a promotion strategy. So K•9 came in with more of a whimper than a bang. His debut episode of THE INVISIBLE ENEMY (part two) scored the third lowest ratings of the season — 7.3 million viewers.

The problem was the decision to keep K•9 a secret. Newspapers and organisations like the *Doctor Who Appreciation Society* were specifically asked not to print photographs of K•9 in advance of the official unveiling.

This was not adhered to by all parties, however. The *News of the World* printed a picture a few weeks in advance of the date. Worst 'offender' though was the BBC. The regional news magazine **Points West** covered the filming for THE SUN MAKERS in and on the Wills cigarette factory in Bristol, and included an interview with the stars — Tom Baker, Louise Jameson, and K•9.

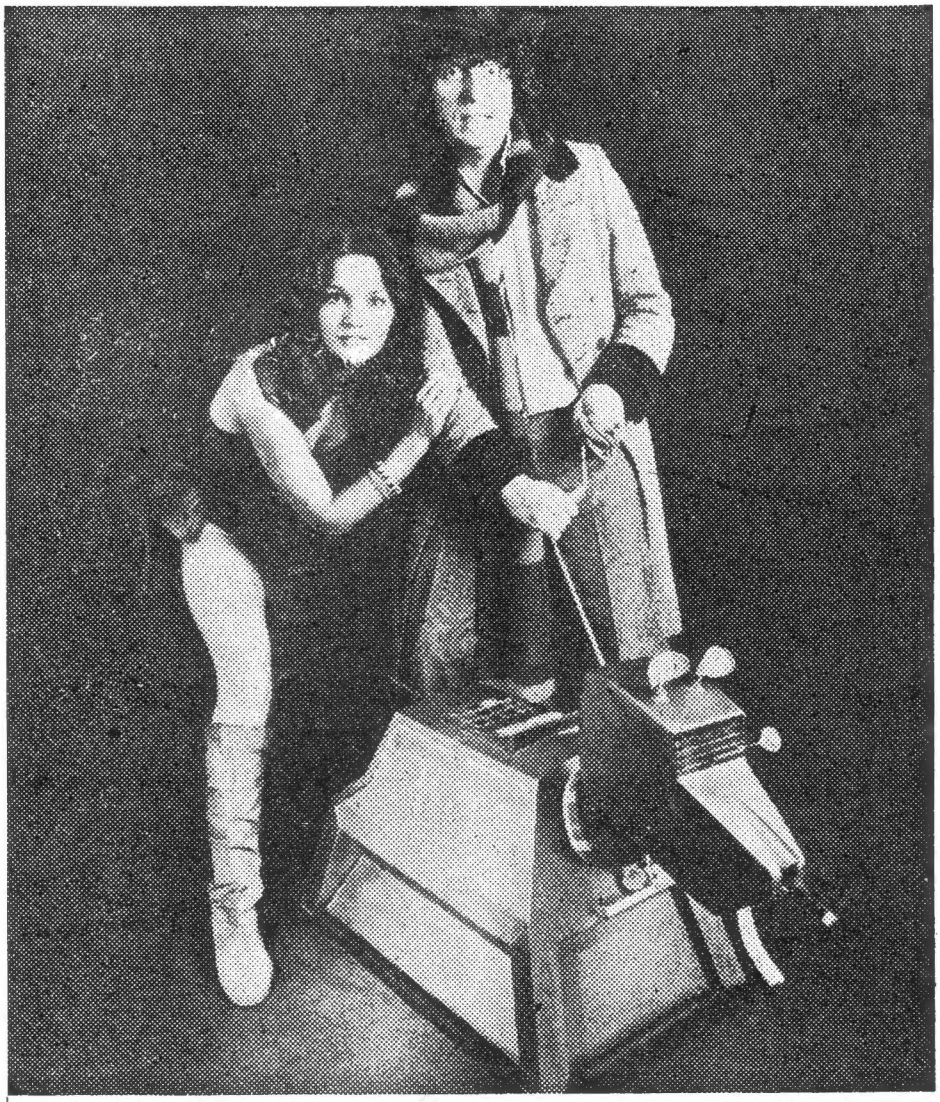
But 'officially' a press call was arranged for October 6th, 1977 on the streets of Acton. The cast and crew of **Doctor Who** were mid-way through rehearsals for UNDERWORLD, which is why Louise Jameson was wearing her new costume. By then the first part of THE INVISIBLE ENEMY had been shown, with no publicity at all from *Radio Times*.

By not requesting a feature to accompany part one of the new story, the production office had lost its chance to introduce K•9 to the readers of Britain's biggest-selling magazine. The best the editors were willing to offer for part two was a quarter-page black and white photograph.

Part one of THE INVISIBLE ENEMY had scored an acceptable rating of 8.6 million viewers. But even so, the **Blue Peter** office was asked to see if they could feature K•9 in advance of part three of the story.

A slot was agreed for Thursday 13th October. The resulting feature was presenter John Noakes squatting on his haunches to interview the robot for five minutes. **Blue Peter**'s other resident canine, Shep, being suitably jealous, barked incessantly during the feature, chased K•9 round the studio, and at one point almost managed to topple the machine over.

By this time, John Leeson had ceased using a modulator to enhance K•9's voice, so there was a contrast between the voice of K•9 in the live studio interview and the accompanying clip from part two of THE INVISIBLE ENEMY.



Radio Times

The Doctor and Leela are joined this week by a new ally, K9, who'll be helping them in the fight against* The Invisible Enemy. Dr Who: *6.5

The extra publicity had an effect. Part three's ratings rose slightly to 7.5 million, and the serial closed back on a high note of 8.3 million. The recovery was well-timed.

September 24th had seen the networked debut of a new American science fiction series, **The Man From Atlantis**. Premiered in the Spring as a series of television movies in the States, **The Man From Atlantis** had proved a good ratings-puller, and was purchased for the entire ITV network by their principle buyer, Leslie Halliwell.

On the day that part two of THE INVISIBLE ENEMY was shown, ITV broadcast the second of the four movie-length **Man From Atlantis** stories — THE DEATH SCOUTS. It successfully drew two million viewers from the BBC's **The Duchess of Duke Street**. Obviously ITV's next move would be to schedule the sf show against **Doctor Who**. □

ITV (LONDON region) SATURDAY 8th OCTOBER 1977

NEWS	MR. AND MRS. quiz	THE MASTER-SPY GAME	NEW FACES variety	TV movie THE MAN FROM ATLANTIS The Death Scouts				POLICE WOMAN (U.S)	NEWS	ENGELBERT HUMPERDINK IN CONCERT	
5:00	5:30	6:00	6:30	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30 11:00

BBC 1

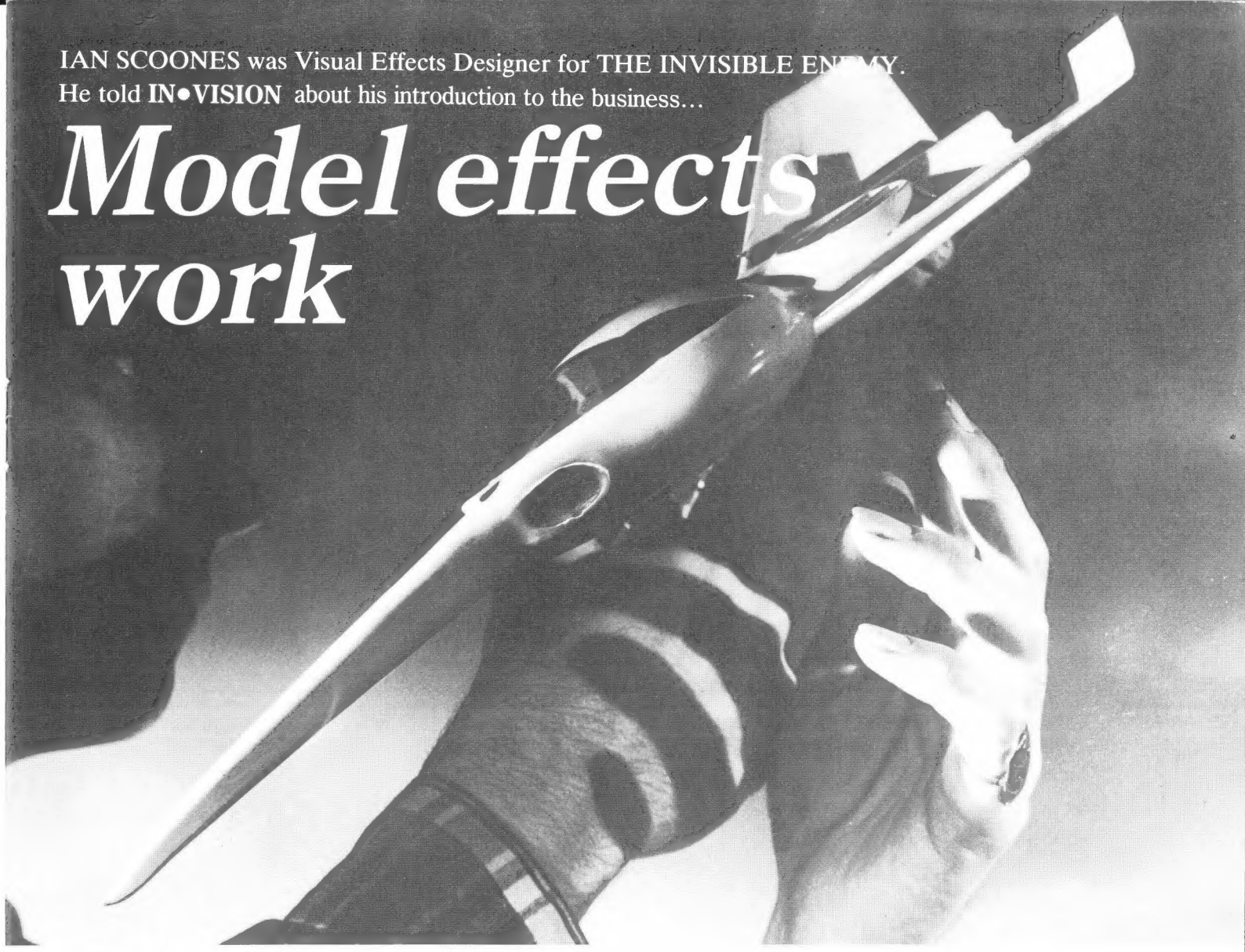
SPORT	TENNIS &Y	NEWS	STAR TURN	DR. WHO Inv 2	THE GENERATION GAME	THE DUCHESS OF DUKE STREET		DICK EMERY SHOW	NEWS	INTERNATIONAL SHOW JUMPING	MATCH OF THE DAY		PASSWORD
5:00	5:30	6:00	6:30	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	

BBC 2

FILM	HORIZON rpt. from Friday		OPEN DOOR	SIGHT & SOUND Elkie Brooks		NEWS	TG HUEN	THE LIVELY ARTS Concert Andre Previn/LSO		film BAMBER & PAGANINI			NOTKER

IAN SCOONES was Visual Effects Designer for THE INVISIBLE ENEMY.
He told **IN•VISION** about his introduction to the business...

Model effects work



PETER Cushing got me into the business. It was an introduction you couldn't forget. After art college I wrote seventy-five letters to film companies begging for work — with no result.

"So in desperation I turned up at Peter's house, loaded down with all sorts of pictures I'd done at college and a bag of various models and things I'd made. Peter's wife Helen answered the door. She said 'Oh yes — he'll be delighted to see you', which of course was not true. 'He is in', she said, 'but he's down at the beach, playing with some little children.'

"And he was. He'd made a model paddle steamer and he and was playing with it in the sea, dressed in only his swimming trunks and surrounded by a ring of kids."

Ian Scoones introduction to Cushing paid hansome dividends. He was recommended to Hammer's Art Director, Bernard Robinson, and went for an interview.

"I'd drunk some bad beer at the railway station, to get my courage up, and I felt and looked awful! Bernard had no work to offer, but during the interview a foot came through the ceiling — literally. It was Les Bowie's, he'd been clearing up in the room above after a fire and had slipped. Anyway, we were introduced, and Les took one look at me and said 'We'd better give this boy a job before he dies!'"

Working for Bowie, Scoones became proficient in a range of effects techniques from matte painting to pyrotechnics. He also learned how to improvise effects on a tight budget.

"When Disney came over here to shoot *Swiss Family Robinson*, they brought with them a whole team of American effects designers. But because of union rules they also had to take on a percentage of British designers. Who they ignored.

"One key scene involved a shot of loads of arrows flying through the air down at the beach. The director wanted the arrows to come down into shot from over the camera. Anyway, the American effects men had imported spring-loaded catapults they'd made specially to hurl the arrows at the exact trajectory for the shot.

"They tried the sequence eight or nine times and each time something went wrong. The director was tearing his hair out. Les Bowie tried to offer suggestions several times, but each time the Americans shouted him down, until finally the director said, 'Okay, let's give the Limeys a chance.'

"Les told the cameramen to start shooting, and he and his team each picked up a handful of arrows and flung them into the air from behind the cameras. They got it in one take."

In 1965 Scoones moved on to join Gerry Anderson in Slough and worked as one of the effects directors on **Thunderbirds**.

"**Thunderbirds** was a nightmare to work on. You started at 8 in the morning, and on a good day would finish at around 9.30 that evening. But very often we worked on, usually well into the night — frequently doing Saturdays and Sundays as well. But I did learn a lot from Derek Meddings about filming models and miniatures — what sort of lighting to use, what types of film, shutter speeds, the whole works really.

"I went back to 'Bowie Films' in 1966 and worked on a series of films culminating in *The Battle of Britain* in 1969. After that the whole British movie effects business seemed to go into a sudden decline and many of us found ourselves faced with unemployment.

Model effects work

"Fortunately, around then Auntie Beeb began expanding her Visual Effects Department and taking on people from outside. They actually put advertisements in *The Evening News* for model makers. A lot of us went to work for the BBC then, when the crunch came. There was myself, Tony Harding, and Richard Conway. Jack Kine later said they 'decided it was time to get a little influence from the outside world.'"

Scoones main mentor at the BBC was Bernard Wilkie (who, together with Jack Kine had founded the Effects Department). Wilkie gave Scoones his first assignment on **Doctor Who**, which was creating and filming the spaceship miniatures for THE SPACE PIRATES.

"Fans have told me they liked that one because the models looked very *2001*. In fact you can get away with a lot more when you film in black and white than when you film in colour. Working in black and white means you are working purely with light and shade, so creating things like false perspective and interesting shadows is much easier.

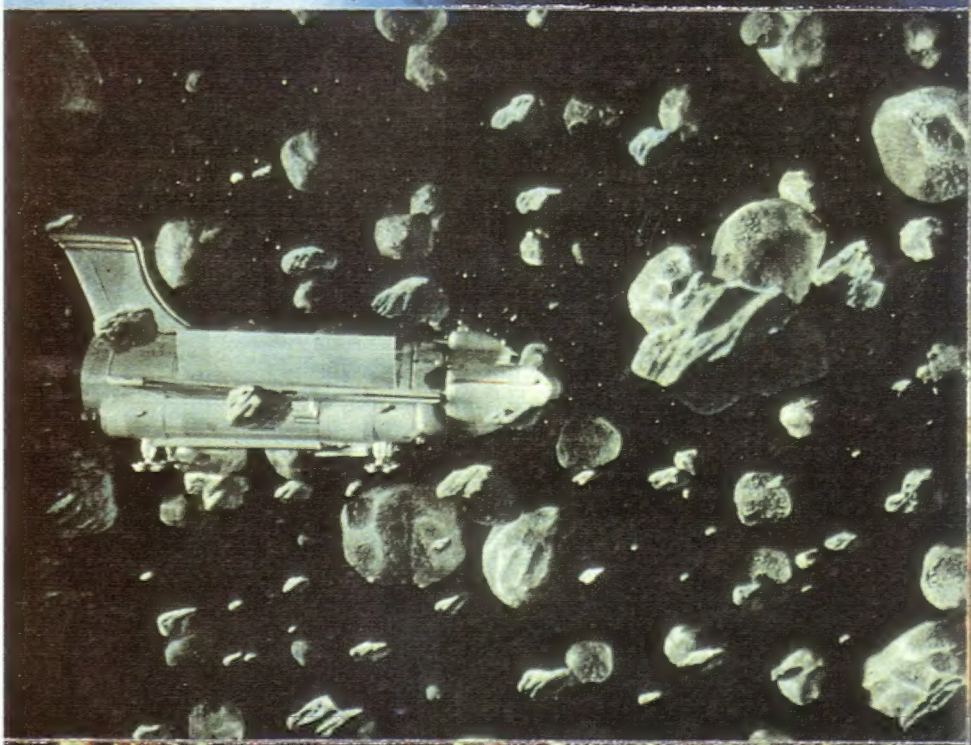
"Going into colour presented the BBC's film camaramen with a challenge they couldn't deal with when shooting miniatures — simply because they never had the experience in that field which people like Harry Oakes and Nick Allder had learned through doing things like **Thunderbirds**.

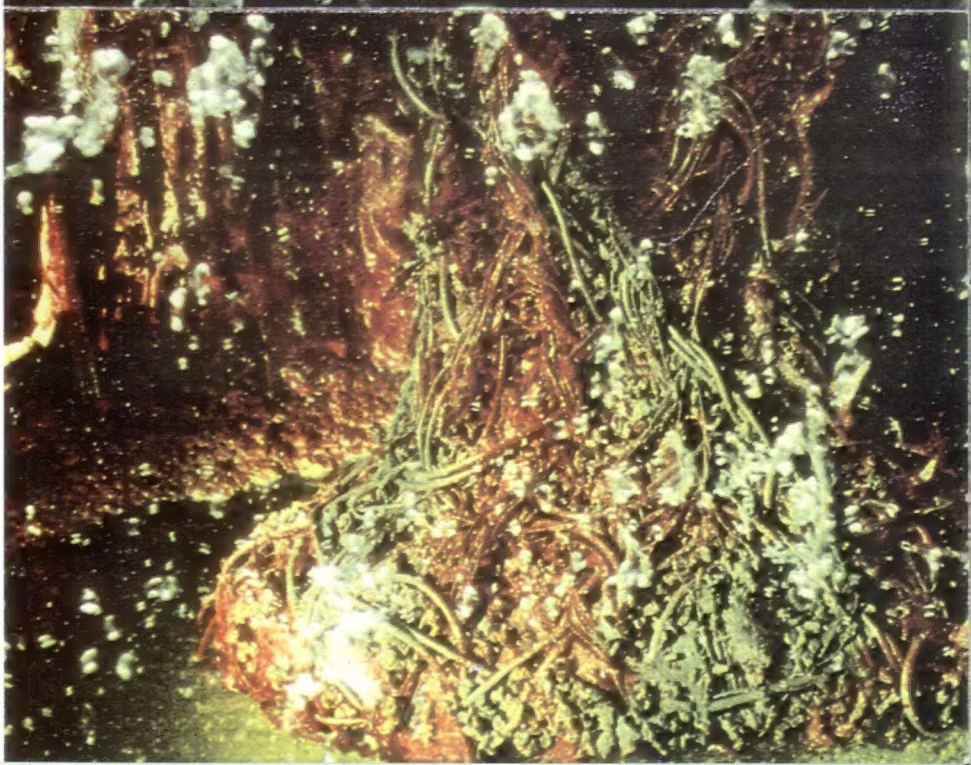
"The models for FRONTIER IN SPACE suffered because they were lit badly — you never achieved any depth to those pictures. That's why, when I became a designer and could persuade Bernard, I pushed for using Bray Studios as a miniatures facility and for hiring cameramen who did know how to light and shoot models.

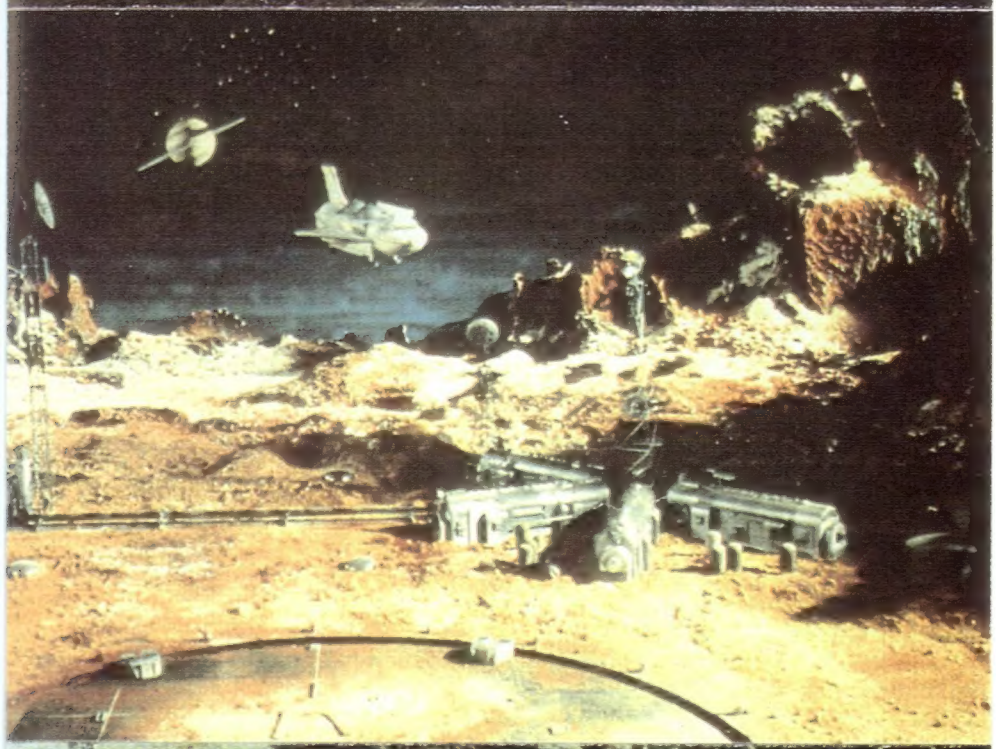
"Bray was also an advantage because a lot of stock sets and props were stored there. A big coup was getting hold of so much stock from the dissolution of Anderson's 'A. P. Films/Century 21' group after he and Arthur Provis parted company. They were just taking stuff out and dumping it in the car park to sell to whoever would have it. When I heard what was happening I went to Bernard and asked him to hire a van. Mat Irvine and I went down there and bought everything that was left. It was a big library of stock items for the BBC at a time when we were getting more and more into miniatures. To have a whole set of different model oak trees in stock means you don't have to pay someone to make them specially every time you need one.

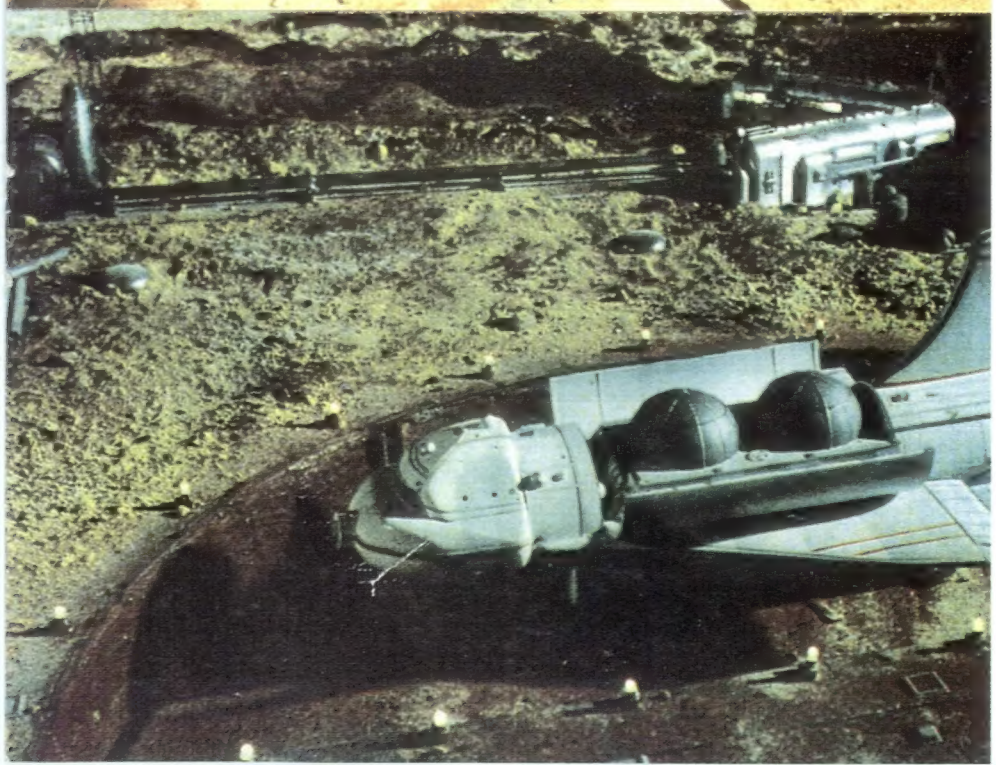
"We also inherited tons of plastic bits to make spaceships. Because of what Derek Meddings and Brian Johnson and people were doing the style of making spaceships had shifted to sticking lots of little bits on to make them look busy.

"Originally I was going to do THE INVISIBLE ENEMY just as an ordinary **Doctor Who**. But then we realised they were









asking for about double the usual amount of work. So Bernard, in his wisdom, said we must have two designers — one to concentrate on the floor effects, the other one to work purely on the miniatures.

"I think Tony Harding did a brilliant job on K•9. In advertising alone that dog was reckoned to be worth a million to the BBC — yet they wouldn't release it to be used commercially. So many companies approached the BBC wanting to use K•9 to sell their products, it really was a golden opportunity wasted. For a long time K•9 was getting more fan mail than the Doctor.

"I'm sure Tom Baker won't mind too much letting this out of the bag, but there were days when he would deliberately kick K•9 in the hope of making it malfunction. He didn't care for the fact that K•9 was getting more publicity or more shots than he was getting.

"I wanted K•9 to be more ferocious — an armour-plated, altogether more sinister-looking creature. When I see an effect in a script, I'm always looking at ways of interpreting it to get more drama out of it. If it's too 'nice', or if a producer and a director go out of their way to make it silly, then I think it fails.

They did that with Arcturus in THE CURSE OF PELADON. We built something that really looked sinister — a latex-covered skull, really, a hideous deformed face inside a mobile breathing tank. It should have sounded terrifying. But instead they gave it a cute little high voice simply because they thought it was too shocking. I make no bones about it, I like to get reactions and I like to shock people, even if they're kids. Kids love to be shocked — just look at the material they're brought up on: *Punch and Judy*, *Grimm's Fairy Tales*, even **Doctor Who**...

Leaving Tony Harding to worry about the floor effects and live-action scenes, Ian Scoones and his team took over some of the smaller sound stages at Bray to shoot the miniature sequences. But why did Scoones use Bray rather than bring his largely ex-Anderson team to the BBC's Ealing Film Studios?

"The unions just would not allow it, and BBC cameramen would not permit freelancers to come in. But there was nothing wrong with us going outside to another studio and hiring the people and equipment we needed.

"Most of the staff at Ealing, except for a few of the old boys who had come from the film industry but who were on the point of retiring now anyway, had never been trained with anything other than the standard 16mm equipment. They had never used a 35mm high-speed *Mitchell* and so weren't familiar with its facilities and the effects that camera could give you on screen.

"I had always been on incredibly friendly terms with everyone at Bray since my days

Model effects work

with Les Bowie. 'Hammer Films' had long gone by 1977, but the people who ran the studio, from the management to the electricians, were still there — calling themselves 'Bray Studios International'. I must confess that some of my reasons for choosing Bray were purely selfish, simply because I wanted to keep a foot in the film industry even when working for the BBC.

"The only shots I wasn't happy with on THE INVISIBLE ENEMY were those of the hospital asteroid. But that was something I couldn't change because it had to marry up with what the set designer had done. I'm not sure if it was in the script or if it was something Barry Newbery had conceived, but the whole thing had to look like a gigantic sponge in space with bubble-shaped blisters everywhere and a huge red cross on it.

"I wanted to shoot the whole thing upside-down, as we were in space, but the director said no. Then of course, somewhere along the line, either the editor lost some of the footage or else our continuity sheets went missing. So none of the correct establishing shots of the asteroid were used in the final print. All the long shots you see are of it after the explosion when it's damaged.

Really the producer should have spotted something like that, or possibly the director — although in my days at the BBC directors were usually not interested in effects shots, just with getting their talking heads.

"I try to eradicate myself from blame on that one because I did some very detailed storyboards for all the effects scenes in that story. It was part of my training to do storyboards, because that is how you work in films, and I'm a great believer in them. A picture, as they say, is worth a thousand words. And what you tend to find in television, sadly even among those people who make programmes, is how few of them actually possess a visual imagination. Very often they just cannot *see* an idea you are trying to convey to them. So I use storyboards. That way everyone gets an instant understanding of how something might look, and you tend to get agreements much sooner.

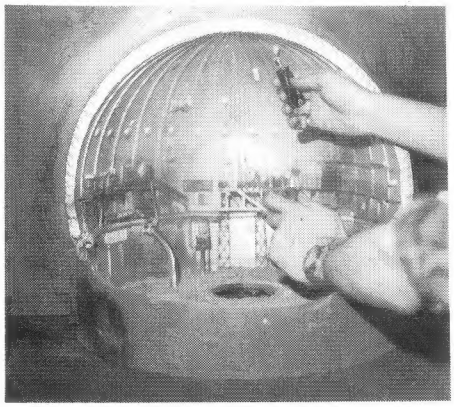
"Most of the models for the scenes inside the Doctor's body were made by my assistant Steve Bowman. His father was the principal of an art college somewhere out Hounslow way, and he found a lovely material there that you could poke your fingers through and pull into all sorts of different shapes. And once you'd painted and sprayed it all up, it made a marvellous-looking brain. Then once we went into the studio it was a case of tilting the camera to match the perspectives and angles on the model, and then laying down strips of invisible tape on the ChromaKey set so that all the actor has to do is follow the path of the tape.

The scene of the virus spawning in the tanks on Titan is strongly rumoured to be footage left over from an abortive remake of **Quatermass II**. In fact this is not true — it was specially made and shot for THE INVISIBLE ENEMY, but using the same construction design and techniques that Ian Scoones had been given years earlier by Jack Kine to recreate the **Quatermass** scene.

*Ian Scoones and Bernard Wilkie working on the space station sequence for the aborted BBC **Quatermass 4***

"I'm quite proud to say that I literally had a hand in **Quatermass** at the BBC, because the only others who can truthfully claim that are Jack Kine and Bernard Wilkie.

"What happened was that in 1970 the BBC decided to do a programme called **Those Were The Days** which was a feature on the 1950s. And they decided they wanted to use the famous scene from **Quatermass II** of the monster growing inside the tank. But, either they couldn't find the tape or they decided it wasn't of good enough video quality to broadcast. So they asked us if we could recreate it for them.



*The **Quatermass II** model made by Scoones, and recreated for THE INVISIBLE ENEMY*

"Jack Kine called me into his office, and described exactly how they'd done the original sequence, what the model set was made of and so on. And from that I rebuilt the tank and the monster and we shot it at Ealing that summer. I got quite a kick out of hearing people in the pubs they following night saying: 'Wasn't it great to see that bit of **Quatermass** again — just exactly as I remembered it.'

"Three years later I got involved with **Quatermass** again. Nigel Kneale had written a script for **Quatermass 4** which the BBC was considering making. Part of that involved some miniature shots of a space station with rockets docking and astronauts working on the hull. Bernard and I actually designed and built all the miniatures, and we filmed the sequences down at Ealing in June 1973. However, for whatever reason, the BBC decided in the end to scrap the project, so the footage was never used. I did see the ITV version years later — same sequences, but done very differently from the way we planned it.

"None of the **Quatermass** model sets were kept from either venture, but when a similar shot was called for in THE INVISIBLE ENEMY all I had to do was look back through my scrapbooks and figure out how to reproduce more or less the same set for **Doctor Who**. I knew it would work that way, so it was one less thing to worry about. □

Production S

STAR WARS was coming. When THE INVISIBLE ENEMY was first shown, *Star Wars* was being hyped for its December 1977 release in Britain. Giant posters were up everywhere, magazines abounded, and hardly a week went by without one of the national dailies running a feature on the film that saved *Fox*.

For the younger audience, a major promoter of the film was the Granada Television cinema review programme **Clapperboard**. The programme was presented by Clive Kelly, and in the Autumn of 1977 took every opportunity it could to present themes which gave it an excuse to use clips from the film. Among the clips used there were invariably sequences involving C-3PO and R2-D2.

Cute robots

R2-D2 was, the planners in care related – as loveable as its predecessors from *Silent Running*, Huey, Dewey and Dewey, and with as much faith in gadgetry as *Forbidden Planet*'s Robbie the Robot. One of the legacies of *Star Wars* would be a plethora of cute robots over the next few years: from *The Black Hole*'s Vincent to **Buck Rogers**' Twiki. One film, a comic Italian offering called *Toy Hammond* even had a comic relief in the shape of a dog, complete with mechanical legs and a wagging antenna tail.

The myth that grew up from all this is that **Doctor Who** jumped on the *Star Wars* bandwagon when it brought in K•9. In fact, this was not the case. Although the bulk of the filming for *Star Wars* was done at Elstree studios in England during 1976, details of the movie were kept very secret until its completion in March 1977. With the enormous budget given the film, the last thing that the ailing *20th Century Fox Corporation* wanted to risk was that a low-budget exploitation picture would be rushed out ahead of the American screening of *Star Wars* in the Summer of 1977.

So up until late Spring 1977, when publicity actively began in the USA, almost nothing was known of R2-D2's potential and personality. By that time scripting and design work for THE INVISIBLE ENEMY was all but complete – the story finished recording on 26th April. Bob Baker confirms that K•9 was not inspired by *Star Wars* – "Not even slightly. Not in any way."

Star Wars also introduced a new catchphrase – "May the Force be with you". Baker and Martin were also fond of catchphrases, such as "Eldrad must live" in THE HAND OF FEAR and "The Queen is the Queen" in UNDERWORLD. The memorable phrase from THE INVISIBLE ENEMY, uttered by everything who is infected (except for the Doctor – the Nucleus says it for him) is "Contact has been made". Bob Baker explains this as using a convention from melodrama, which, after all, **Doctor Who** is a form. Baker: "I don't think *Star Wars* affected how the audience felt about the series. **Doctor Who** is the TARDIS and time travel. It's not space opera and conflict in the way *Star Wars* was – a war story set in space. **Doctor Who** is never quite that. It always is melodrama as opposed to high budget, out in the open adventure – it can't be, because it doesn't have the budgets. There is no way really it can be action-adventure. Terry's *Star* was good to do a lot more things like space ships, and the visual features developed."

Lost script

It was planned from the start that THE INVISIBLE ENEMY would be the second story of the 1977/78 season of **Doctor Who**. In its earliest stages it was intended by Graham Williams to be the second part of his linked-theme season. The linking theme was to be that of a terrible evil force gathering strength in the universe while the Doctor battles to fail to oppose it.

However, the sudden collapse of the opening chapter, THE WITCH LORDS (see last issue's *Obelisk*) threw the whole season's structure back into the melting pot. At things stood, the season was already behind schedule – partly due to Robert Holmes' late decision to remain for a while as script-editor until he could find a replacement.

So it was fortunate that, when THE WITCH LORDS had to be scrapped, Holmes had engaged writers who could work quickly and to a high standard among the many offers to redress the plans for the season.

Since he was unable to make his mark on the show using his theme-renewal, producer Graham Williams looked for alternatives.

K•9's introduction

The alternative he picked was K•9. On their own initiative, writers Bob Baker and Dave Martin had conceived the idea of a middle-sized robot almost like a mechanical dog. Their earlier story THE 'WAY' TARDIS EXPERIMENT had already shown the BBC's Visual Effects Department capable of constructing and operating a gadget machine. K•9 was initially seen as a logical progression of the techniques used in making Fight Magic story's robot.

Although they had not had an any purpose details of K•9's appearance in their original script for THE ENEMY WITHIN (which was the original title for the story), Baker and Martin had worked on the assumption that the dog would be achieved by having a small actor in a costume. In the finished rehearsal script K•9 is described as a

"personal Computer which is like a toy dog on wheels... with a screen for a head, a pencil-slot gate for a mouth and an antenna for a tail. In response to listening on cue[?] back to the name 'K-9' with, much smaller. If found, return to Professor Marius X9. He speaks in a small, metallic voice."

Further on in the script, there is a reference to K•9's "scampering off to carry out his tasks", emphasising the writers' impression of a device capable of rapid, decisive motion.

Graham Williams felt that K•9 had potential beyond the confines of just one story, and began discussions with Visual Effects early in 1977 about designing it as a remote-controlled prop. He accepted that the cost would be quite high, too much for a story already committed to a large allocation for model making and miniature filming. So in connection with **Doctor Who**'s new Production Unit Manager John Nathan-Turner, Williams worked out a way of spreading K•9's cost across the whole season – similar to the way in which his predecessor Philip Hinchcliffe had paid for the extravagant TARDIS of the previous year. But all the same the option of keeping K•9 in the series or not was kept open.

Anticipating that ROBOTS OF DEATH would probably come in under budget, Williams decided to plough a lot of money into the Baker-Martin story which began production with the crew working title THE INVISIBLE INVADER. To cope with the workload, Bernard Wilkie assigned two Visual Effects Designers to the story. Installs Ian Scoones was appointed, Tony Harding was brought in as Effects Assistant and they decided to split the work so that Scoones handled all the miniatures while Harding did the model effects and special props – including the design of the Nucleus and of K•9.

The making of K•9

Before Harding joined, Scoones had already done some thinking about how to achieve K•9. He even got so far as having the rehearsal equipment from out of Visual Effects and working on the AM frequency, according to Mat Irvine's book *Doctor Who Special Effects*. As well as a standard screen, grey eye mounts and antennae rail, the script also called for an extendable sensor probe, radar 'ears' and a gun. Always looking towards making his creations as frightening as possible, Scoones designed what was planned to be Williams' first armoured cyberman. When Harding joined the team, the design was ditched and Harding produced his own. Harding says that that he knows no-one else but K•9 would be released for a mere three per story, he would have appreciated the chance to put more time on the prop otherwise.

Despite going back to the Kaled War City of Quinnessen, the BBC Visual Effects Department had little experience of using radio control. In the past it had been used on a limited degree on location and in studio miniature work, but never in the electronic studio. K•9 would be an entirely new venture.

Four of the ten channels of the Futaba radio control enabled K•9's main motor drive to be switched on and off, the front wheels to steer and the tail to wag. The other six channels were controlled via the blue computer screen light (used in Chromakey

Production

effects like the Doctor's EEG on to it), the ears, the back panel and eye lights, the sensor probe and the extendable nose gun.

K•9's chassis housed his car-battery power-source, the radio-control receivers and actuating servos, the main drive motor and the drive-belt system which was linked to just one of the front, steerable wheels. The limited amount of power meant that the drive wheels could not be too large (they would be too heavy to turn), which was to add to the problem's K•9 experienced on his first day in the studio.

It was largely because the mechanics were unproven that Graham Williams reserved the decision of whether or not to keep K•9 on as a regular companion for the Doctor. But contrary to popular belief, two endings were not shot for THE INVISIBLE ENEMY. One tag scene was scripted and recorded. It showed the Doctor and Leela saying goodbye to Marius and agreeing to take K•9 with them.

The alternative ending was just not to include the goodbye scene, and instead to end with the Doctor, Leela and K•9 watching Titan Base explode, with an added model sequence of the virus cloud dissolving away to nothing — emphasizing that the threat from the virus was now over.

Bob Baker and Dave Martin were surprised by the ultimate decision to keep K•9 on. Bob Baker told **IN•VISION**: "Bob Holmes rang up and said, 'I'd like to keep him on.' I didn't believe it at all. It wasn't until BBC Merchandising started ringing up and talking about how they were going to do this that we realised they did want to keep the dog on."

Effects work

All the model filming was done, unusually for the BBC, using 35mm camera equipment at the independent Bray studios near Maidenhead. Ian Scoones had specifically asked if he use Bray so that he could hire one of the most experienced miniature effects cameramen in Britain — Nick Allder (see the interview with Ian Scoones in this issue).

Like Scoones, Allder had worked with Gerry Anderson, most recently on **Space: 1999**, where he was responsible for much of the model filming done for the first season. One of Allder's main skills was knowing how to light a miniature, which Scoones felt was beyond the technicians at the BBC's Ealing studios.

In 1980 Scoones told *TARDIS* magazine: "We had one week and took it all down to Bray studios, well away from the Beeb. I wanted to use what I consider to be one of the best miniature effects cameramen. I can't bring him on to BBC premises, but I can go outside if there's nobody to do it at Ealing Television Film Studios, and in my opinion they are my shots."They have super cameramen at Ealing for normal types of things. There is no specialised special effects done there, just a crew employed by the BBC. So one goes to where the expertise is, and you get much more freedom down there too. You can blow things up, spill water, make tanks that burst, and nobody minds. You can't do that on the BBC premises, there's just so much red tape. And you can't do it in a video situation with all that electronic equipment around."The BBC would work beautifully in television terms if there were no special effects, just doing run on the mill stuff. But you do need to have a specialised team with you, and even then you have problems because editors are not used to cutting the material together — knowing what they should and should not cut. If you shoot an explosion in space of a spaceship, you don't always blow the ship up. You stop the camera and substitute, in exactly the place where the spaceship was, the explosion. You cut the two bits together and it looks like the spaceship blew up. But if the editor doesn't cut that correctly, he's going to show all your wires and everything else.

"There were about eighty shots in THE INVISIBLE ENEMY as far as the miniatures are concerned, and I had a huge story board in colour of the shots with the effects number, script page number, whether it was on video or film, if it would be repeated at a later stage (so I could get the lab to print up two copies), and obviously the number of man-hours it would take. All these things go on the storyboard, as well as the actual illustrations of what we were going to see on the screen. Doing a storyboard does present at a production meeting something specific to talk about, and the director can say 'No, I don't quite think it should be like that', or 'Yes, fine, go ahead'. So many people aren't visual in a visual medium such as television. Directors aren't. They see it in clos-ups of their actors, and it stops there. Usually you design something, and they say yes or no."

Model work

The model sequences ranged from the relatively simple to the complex. One of the more simple sequences was the establishing shot of a meteor shower. This was actually achieved by dropping polystyrene meteors on an upward-pointing camera. With black drapes giving the space background, the meteors appear to be hurtling towards the viewer.

More complicated was the Titan shuttle. This was built by Scoones' long-time assistant and friend, Mat Irvine. Like the **Space: 1999** Eagles, the shuttle was designed as a multi-purpose spacecraft. It had a bay into which different cargo pods could be dropped. The model was a foot long, and fitted so that it could be flown on wires. It had doors for the cargo bay, but as there were no shots planned that required these to be seen shut, they were fixed open rather than hinged. Two pods were build, one a framework of fuel tanks (as used for the shuttle first taken over), the other a medical passenger module (used for the shuttle which crashes into the Bi-Al Foundation.

The sequence of the shuttle's arrival at Titan Base in part one was the lengthiest model sequence planned for the story. The rolling curve of Titan's horizon as the shuttle passes over the moon was actually the lozenge-shaped lunar drum rescued by Scoones from Anderson's **Space: 1999**. Some of the buildings and other elements of the base were also from Anderson's stock.

But most of the Titan Base model from built from scratch. The backdrop starscape with Saturn and a low atmosphere horizon painted on was made by Ian Scoones. The stars were achieved by punching holes through the backdrop to allow light to shine through. The holes had to be relatively large so that the light would be picked up by the film camera. "With hindsight, some of them were actually a bit too large, I think" remembers Scoones.

Some of the outbuildings of the base had internal lights, and there were motor-driven radar dishes. The main feature was the landing platform which was built over a camera dolly, so it could be lowered on cue.

To simulate the shuttle's landing jets firing, fullers' earth was scattered on to the platform, and a gentle breeze from a fan rippled it convincingly as the shuttle was lowered on its wires.

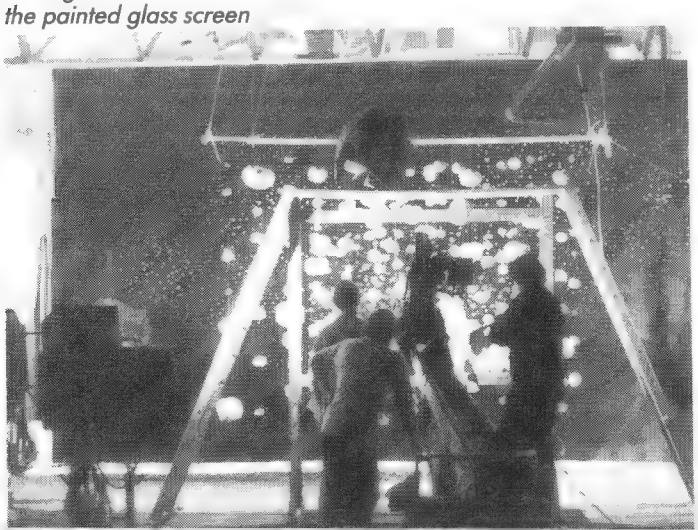
Despite its size, overcranking the camera to 72 frames per second combined with some use of fish-eyed, wide-angle and close-up lenses greatly enhanced the apparent size of the models. Scoones has always favoured making models as large as possible partly to allow room for detail, and also to allow more freedom for camera movement round the model.

For the close-up sequence of the rocket motors firing in part four, a larger model of the tail section of the shuttle was built. Ignitable gas burners were set into the motors' fairings.

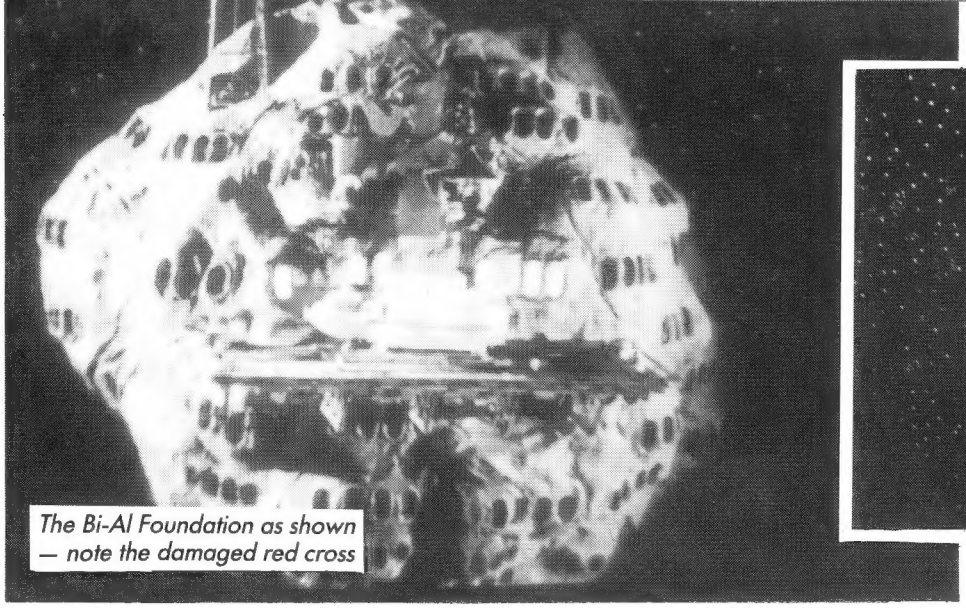
The complete shuttle model was reused in both **Blake's Seven** and the children's science series **Galloping Galaxies**.

The backlit Bi-Al Foundation asteroid was a fibreglass model suspended on electrical wires. So were some of the smaller rocks seen in the asteroid belt sequences. To save on building time and costs, most of the asteroids were painted on to

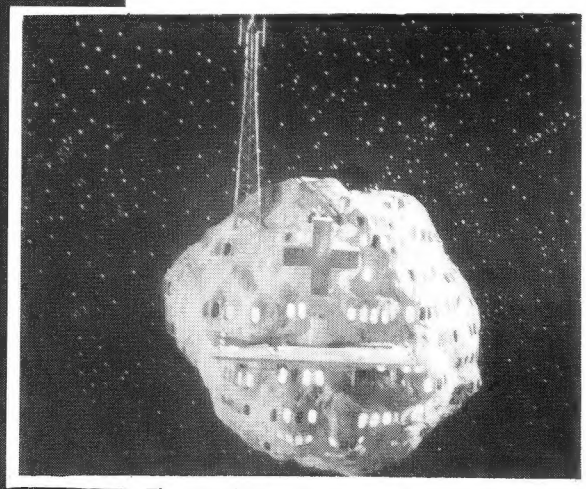
Filming the shuttle in the asteroid belt. Note the painted glass screen



Preparing to shoot the model shuttle over Titan's surface



The Bi-Al Foundation as shown — note the damaged red cross



The Bi-Al Foundation as designed and filmed before it is damaged

glass. The glass sheet was then positioned so that the camera filmed the model through it, with the painted asteroids in the foreground.

The destruction of Titan Base was achieved by removing the landing platform and setting a row of gas burners into the gap. On cue the flames were turned up, and then filmed in close-up. For the long-shots of the destruction of Titan, small electrically-detonated mortar charges were set-off, filmed at high speed. A burning magnesium ball provided the distant scene of the final explosion which was ChromaKeyed on to the TARDIS scanner.

The virus cloud was simply achieved. It was drops of *Dettol* antiseptic disinfectant swirling in a glass tank of water and filmed, using mirrors, from below. Puffs from a smoke-gun enhanced the image of the agitated cloud, and either the shuttle or TARDIS models were matted into the shot, with starscape in the background, and glass-painted lightning flashes illuminated intermittently.

Fantastic voyage

As well as the space miniature work, Scoones also had to design all the model sets needed for the part three scenes set inside the Doctor's body.

Several table-top model stages were built by Effects Assistant Steve Bowman. They were of various artery passages, ganglia, tissue arches, etcetera and had to match in with Barry Newbery's full-size sets. Lighting the models was of prime importance in several shots which served as backdrops into which the Doctor and Leela, or Supervisor Lowe were ChromaKeyed. Others shots were more complicated, with the actors required to navigate round a plain blue set so that When Keyed in, they appeared to be wandering through the model.

The first studio recording block ran for three days from Sunday 10th April 1977. All the inner-body scenes were recorded during the second studio block, which was 24th, 25th and 26th April.

The TARDIS

On the first day in the studio, all the scenes aboard the shuttle and within the TARDIS were recorded. ChromaKey was used both for the starscape views seen through the shuttle windows, and for the pictures on the TARDIS scanner.

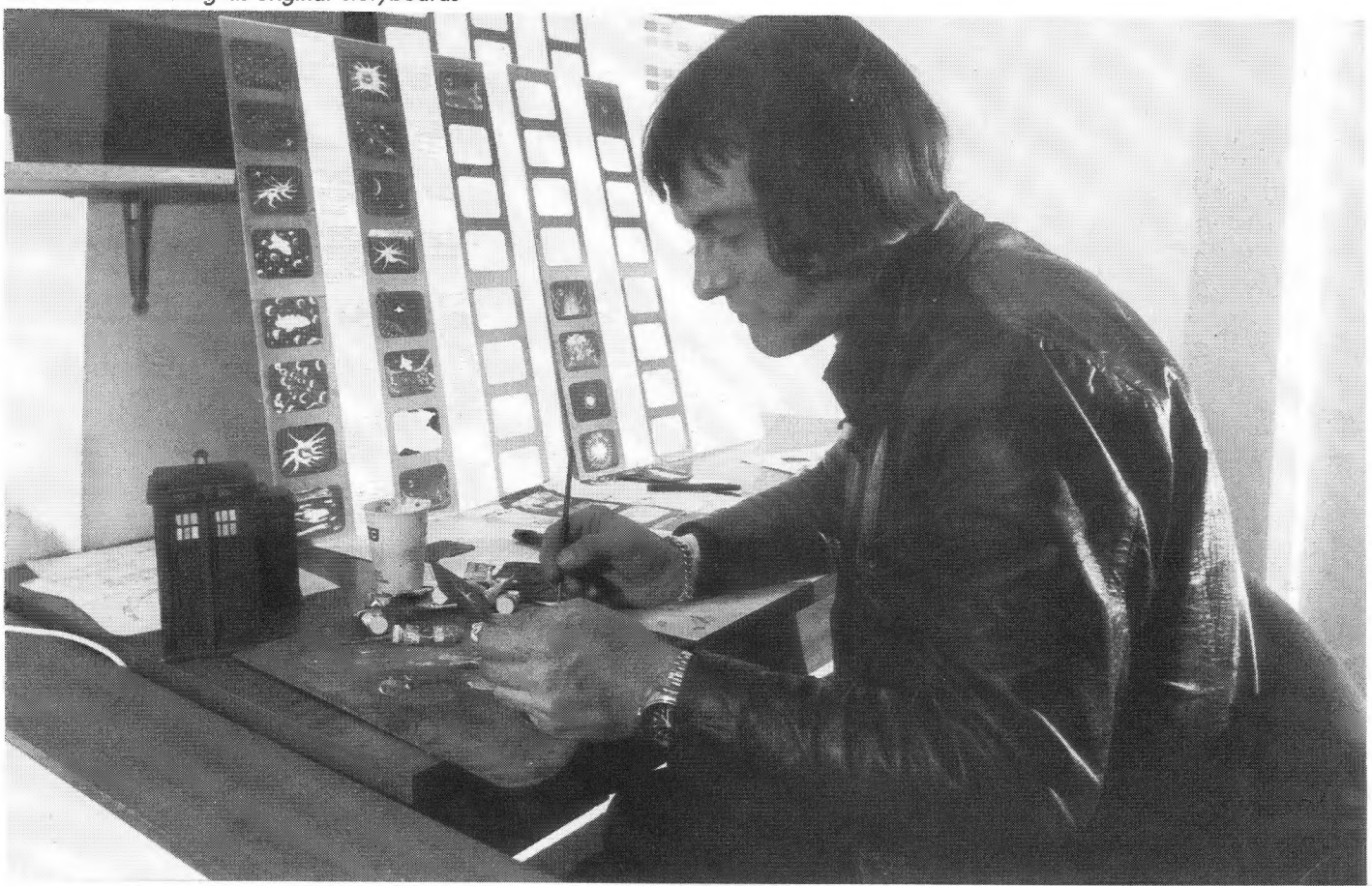
Severe warping had damaged the wooden-look TARDIS control room sets which had been in storage since recording THE ROBOTS OF DEATH (the TARDIS scenes for ROBOTS were done on 23rd November 1976). Again it was Barry Newberry's job to redesign the TARDIS control room.

But with little spare money this time the new interior was a simplified reworking of the original, with two white walls of serried ranks of roundels and one wall housing the double-gated scanner. As well as the main double doors to the outside worlds there was also a single door on the right-hand side to lead into the rest of the ship.

The central console was repaired, refurbished and repainted, then pressed into use for the first time since PYRAMIDS OF MARS. But despite a reworked interior, the central time rotor refused to work during THE INVISIBLE ENEMY, and so is never seen to move.

The key sequence of the Doctor's infection was shown by the camera de-focusing, then zooming in and out of close-up on the Doctor's face as John Leeson's Nucleus voice says:

Ian Scoones creating his original storyboards



Production

"Contact has been made."

A dog's studio life

April 10th marked K•9's debut in the electronic studio. Fortunately he was required only for a few scenes that day (scenes set within the TARDIS) as the radio-control gave cause for concern.

Essentially, the A.M. radio signals from K•9's control boxes generated interference patterns on the output pictures from nearby cameras. In a similar fashion, the signals from the cameras were picked up and interpreted by K•9's receivers as control commands. Often these rogue signals sent the robot off course, or crashing out of control into the walls of the set.

It took careful choreography by director Derrick Goodwin to keep K•9's operators away from the cameras, and the cameras away from K•9.

K•9's low-torque drive was another problem. It was prone to jamming if the wheels encountered even a minor obstruction — such as one of the many small pieces of the polystyrene detritus left from one of the battle scenes in the Bi-Al Foundation's corridors.

First studio

The second day of the first studio session was mainly Titan Base day. All the scenes in and around Lowe's office were done as well as the mess room scenes and some of the corridors. Some of the windows were given detailed painted backdrops showing other external areas of the base. While Lowe is hiding from Safran and his colleagues, in a couple of scenes he is visible outside the window, in front of the backdrop — watching the TARDIS arrive, for example.

Recorded, but later pruned during editing, was Leela knife-throw killing of Meeker. The final cut shows Leela retrieving her knife from Meeker's back, and even this segment was removed from the version shown in Australia.

A sizeable part of days two and three was spent on the fight scenes in the Bi-Al corridors. This took time to line up the shots into which electronic effects designer A. J. Mitchell would have to add optical effects such as ray gun beams and blaster flashes.

Once again K•9 proved a problem, as he could not even point his gun horizontally — let alone upwards. The best Mitch could do realistically (bearing in mind that the cameras had to be kept well back from the K•9 prop) was have the dog shoot its targets no higher than the waist. In fact, for the scene where K•9 scans the unconscious Leela with his probe, the prop had to be lifted up at the back (out of shot) to enable the probe to point downwards.

All the remaining Bi-Al scenes except for those in Marius's lab were completed on day three — including an effects sequence where K•9 was required to shoot down a section of wall. Unfortunately it proved impossible to disguise the crack between the section designed to fall out and the rest of the wall — especially on the required re-take.

Set design

For this story Barry Newbery used a futuristic alphabet font to complement the script's call for all the signs and lettering to be in phonetic English ("Finglish", as the script calls it). Consequently all the signs were written strictly according to how they sound.

Examples of the *Finglish* used are: *SHUTL AIRLOK, IMURGINSEE EGSIT, ORDNANS, KRYOJENICKS SEKSHUN, KAZYULTY, ISOAYSHUN, ENTRUNS, MEN/WIMIN, SENTA,* and of course *K•9.*

Baker and Martin used the phonetic spelling because, as in THE MUTANTS, they wanted to create a realistic future world. Bob Baker: "Everything had its own logo, it was the sort of thing we liked doing."

Second studio

The first day of the second studio session was perhaps the most demanding with many of the scenes in the Doctor's body needing to be taped. The less-complicated scenes were done first, so as to get as much as was easy recorded quickly to leave time to line-up the trickier shots.

One whole corner of studio TC6 was set aside for the bodyscape models, some of which were working miniature sets with running streams of water and banks of coloured lighting.

Next to this was the ChromaKey area. This was not just a flat empty set draped in blue. The cloths also had to mask ramps, steps and drapes so the artists could be seen, for example, walking uphill as they approach the mind-brain interface. Vignette models were also employed to give greater depth of field to long shots.

The scenes in the body ran over two days — and took a lot longer than had been scheduled. As a result some had to be abandoned. The main loss was a scene of the Kilbracken clones fragmenting and gradually dissolving as their life ends. Since there was not enough time to accomplish this, the fading voice of the Doctor was dubbed over a confused shot of his image fading out, a blaster flash, and charred floor where the Nucleus had been. This was followed by a close-up of Leela's knife and a lock of her hair lying on the ground. Given that this was almost the end of part three, it was reasoned that the confusion would help suspend the enigma for another week until all was revealed in the final episode.

Bob Baker says of the scene of the Doctor and the Nucleus debating the right of the Virus to live: "That's a basic rule — do you believe in life or destroying it? Nowadays I suppose you'd call it 'green'. It was a worthwhile discussion to have.

"The Tom Baker Doctor did have morals, but they may not have run on quite the lines people think they should. It was nice to be able to twist them away from what might be called the boy scout norm. A good instance of that was the Key To Time — 'Should I give it to the White Guardian? No, I'll throw it away and won't give it to any of you!' — Bang. That was him thinking by himself."

What was left of the second studio day was taken up with scenes in the Titan Base corridors and tank area. Careful use of ChromaKey, backdrops and false-perspective ceilings made the sets for the base (which appears to be hewn out of the rock) seem bigger than they really were. With no money to do any live-action film work at the BBC's Ealing studios, even what was scripted as the biggest set, the breeding tanks, had to be accomplished within the smaller confines of the studios at TV Centre.

The Nucleus

Day three was the only day in which the full Nucleus monster was used. Operated by experienced monster actor John Scott Martin, the Nucleus was designed by Tony Harding to the script's specifications:

"The hideous shape of the full sized Nucleus, unobscured by rock, is a man-sized, armoured, exo-skeletal multipede — like some vile, blood-red prawn..."

The Nucleus was made of latex and fibreglass over a metal and bamboo frame. It was unable to move by itself — John Scott Martin had to balance on his backside and use his arms and legs to operate the creature's limbs.

All the lab scenes were also shot on this day. Many recording pauses were needed to allow for make-up changes, depending on whether the characters were supposed to be possessed by the virus or not at each stage. The sequence of the Doctor recovering was a simple roll-back-and-mix shot, fading from Tom Baker with complete make-up to Tom Baker in the same position, but without the virus make-up applied. The same technique was used at the beginning of part two to show the Doctor's hand recovering as he fights the virus.

K•9 and violence debate

With K•9 becoming a companion of the Doctor, this was seen by some as giving the Doctor a gun — contrary to his previous moral code. Bob Baker: "He was never intended to be a gun. He was intended to be an extra character that people could talk to. Just to have a gun would be pointless. He had a gun because he was Marius's guard dog. If we'd planned K•9 as a future character, we would probably not have put a gun in him.

"I think it was mentioned in a future programme that he didn't want to kill anybody. It was a computer, stun-gun, and a cutting tool — a handy thing to have around. And you could argue with him, have a kind of rapport.

"I felt other writers did just use him as a gun. And I think the script editors should have picked that out. In fact he got worse and worse — to the point where the final producer had to put him out of action so he didn't interfere with the plot. Writers will use anything to get out of a situation rather than think their way out.

"It was also a reaction to the violence of Philip Hinchcliffe's time on the show. Really we got a hammer down on us from above to cut down on violence. Graham Williams said to us 'Oh my God — all we'll be able to use is jagged polystyrene cups!'

"Laser beams like K•9's are non-blood violence — it's not like an arm blowing away and blood. It was tending to get a bit like that. Sometimes you get the odd close-up on the horror bit, but it was never really that bad. It was all total fantasy. It was more violent when UNIT were in it, of course, with all the shooting and rifle fire."

Transmission

Recording was completed on 26th April 1977. With HORROR OF FANG ROCK next in line for the studios, Graham Williams decided to keep K•9 as a regular companion for the Doctor and Leela and to maintain the planned running order — so that HORROR OF FANG ROCK (with its K•9-proof lighthouse) would be screened before THE INVISIBLE ENEMY.

For THE INVISIBLE ENEMY (and also for later stories in the season), Williams was able to persuade the BBC to show a short trailer at the end of the previous

story's final episode to promote the new story starting the following week. These trailers were thirty-second compilations of highlights from the first episode of the story, with voice-over giving some of the plot outline.

Trivia

Bob Baker was quoted in 1980 (in *Spotlight on Who* issue 5) as saying that the starting point for the story was a newspaper article about virus mutations.

Unlike other victims of the virus, the Doctor's hand is visibly infected before his face.

Marius thinks the Doctor is a "spacenik", which Terrance Dicks, in the novel, compares with a beatnik.

Marius and K•9 supply the information that the first successful cloning experiments were in 3922, and the longest recorded clone life is 10 minutes, 55 seconds.

One joke in the Baker/Martin script was the coordinates for for Titan Base which are programmed into the TARDIS by the Doctor. They are "WHI 1212 EX 999" — both 'phone numbers (at some time) for Scotland Yard.

Also initiated in this story is the season's running joke of the Doctor redecorating the TARDIS. In THE INVISIBLE ENEMY he complains about how bland the black and white thinking of computers is. In UNDERWORLD he is seen redecorating, and then in THE INVASION OF TIME he takes umbrage at Rodan's comment that the TARDIS "could do with a lick of paint", insisting that he spends so much time fighting Sonrarans, Daleks, Cybermen and the like that he hasn't got time for painting and decorating.

The Doctor says that the virus attacked the TARDIS computer before infecting him. Since we never see the Doctor 'cure' the computer, it could be that the TARDIS is still infected.

Perhaps a pointer forward to the theme of the following season, the Doctor says to Leela: "Everything has its place", and tells her that when this is disturbed — such as by the Nucleus escaping into the macro-world — "the delicate balance of the whole cosmos could be destroyed."

There was a letter from Amanda James in the *Radio Times* inquiring why the clones of the Doctor and Leela appeared fully clothed. In reply Graham Williams pointed out that they were not true clones, but (as Marius says) "three-dimensional photocopies." However, the original script did have the clones naked, though this was changed for reasons of decency. Bob Baker told **IN•VISION** "They wouldn't let us have the clones nude. I'd love to have seen Leela naked... I'm not sure about Tom though." □